# CRYPTOSPORIDIOSIS

## DISEASE REPORTING

### *In Washington*

New requirements for the reporting of cryptosporidiosis were instituted in December of 2000. In the first year of reporting, DOH received 73 case reports.

Outbreaks of cryptosporidiosis in Washington have been associated with small commercial water systems and wells; other named sources include infected contacts, animals, and contaminated water and food. To obtain a laboratory test for this parasite, submit a stool ova and parasite (O & P) examination with a specific request for *Cryptosporidia* as routine O & P exams may not look for this organism.

### *Purpose of reporting and surveillance*

- To identify sources of transmission (e.g., a commercial product or public water supply) and to prevent further transmission from such sources.
- When the source is a risk for only a few individuals (e.g., an animal or private water supply), to inform those individuals how they can reduce their risk of exposure.
- To identify cases that may be a source of infection for others (e.g., a food handler) and to prevent further disease transmission.

### *Reporting requirements*

- Health care providers: notifiable to Local Health Jurisdiction within 3 work days
- Hospitals: notifiable to Local Health Jurisdiction within 3 work days
- Laboratories: notifiable to Local Health Jurisdiction within 2 work days
- Local health jurisdictions: notifiable to DOH Communicable Disease Epidemiology within 7 days of case investigation completion or summary information required within 21 days

## CASE DEFINITION FOR SURVEILLANCE

### *Clinical criteria for diagnosis*

An illness caused by the protozoan *Cryptosporidium parvum* and characterized by diarrhea, abdominal cramps, loss of appetite, low-grade fever, nausea, and vomiting. Infected persons may be asymptomatic. The disease can be prolonged and life-threatening in severely immunocompromised persons.

### *Laboratory criteria for diagnosis*

- *Cryptosporidium* oocysts in stool by microscopic examination, or
- In intestinal fluid or small-bowel biopsy specimens, or
- *Cryptosporidium* antigen in stool by immunodiagnostic test (e.g., enzyme-linked immunosorbent assay), or
- By polymerase chain reaction (PCR) technique, or
- Demonstration of reproductive stages in tissue preparation.

### *Case definition*

- Probable: a clinically compatible case that is epidemiologically linked to a confirmed case.
- Confirmed: a case that is laboratory confirmed, may be symptomatic or asymptomatic.

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## A. DESCRIPTION

### *1. Identification*

A parasitic infection of medical and veterinary importance that affects epithelial cells of the human GI, biliary and respiratory tracts, as well as over 45 different vertebrate species including poultry and other birds, fish, reptiles, small mammals (rodents, cats, dogs) and large mammals (particularly cattle and sheep). Asymptomatic infections are common and constitute a source of infection for others. The major symptom in human patients is diarrhea, which may be profuse and watery, preceded by anorexia and vomiting in children. The diarrhea is associated with cramping abdominal pain. General malaise, fever, anorexia, nausea and vomiting occur less often. Symptoms often wax and wane but remit in fewer than 30 days in most immunologically healthy people. Immunodeficient people, especially AIDS patients, may be unable to clear the parasite, and the disease has a prolonged and fulminant clinical course contributing to death. Symptoms of cholecystitis may occur in biliary tract infections; the relationship between respiratory tract infections and clinical symptoms is unclear.

Diagnosis is generally made by identification of oocysts in fecal smears or of life cycle stages of the parasites in intestinal biopsy sections. Oocysts are small (4-6 µm) and may be confused with yeast unless appropriately stained. Most commonly used stains include auramine-rhodamine, a modified acid-fast, and safranin-methylene blue. Additionally, new and more sensitive immunobased ELISA assays have recently become available. A fluorescein tagged monoclonal antibody is useful for detecting oocysts in both stool and environmental samples. Infection with this organism is not easily detected unless looked for specifically. Serologic assays may be helpful in epidemiologic studies, but when the antibody appears and how long it lasts after infection are not known.

### *2. Infectious Agent*

*Cryptosporidium parvum*, a coccidian protozoa, is the species associated with human infection.

### *3. Worldwide Occurrence*

*Cryptosporidium* oocysts have been identified in human fecal specimens from more than 50 countries on six continents. In developed areas such as the US and Europe, prevalence of infection was found in less than 1% to 4.5% of individuals surveyed by stool examination. In developing regions, the prevalence is significantly higher; the range is from 3% to 20%. Children under 2 years of age, animal handlers, travelers, men who have sex with many other men and close personal contacts of infected individuals (families, health care and day care workers) are particularly likely to be infected. Outbreaks have been reported in day care centers around the world. Outbreaks have also been associated with: drinking water (at least three major outbreaks involved public water supplies); recreational use of water including waterslides, swimming pools and lakes; and drinking unpasteurized apple cider that had been contaminated with cow manure.

### *4. Reservoir*

Humans, cattle and other domestic animals.

### *5. Mode of Transmission*

Fecal-oral, which includes person to person, animal to person, waterborne, and foodborne transmission. The parasite infects intestinal epithelial cells and multiplies initially by schizogony, followed by a sexual cycle resulting in oocysts in the feces that can survive under adverse environmental conditions for long periods of time. Oocysts are highly resistant to chemical disinfectants used to purify drinking water. One or more autoinfectious cycles may occur in humans.

### *6. Incubation period*

Not precisely known; 1-12 days is the likely range, with an average of about 7 days.

### *7. Period of communicability*

Oocysts, the infectious stage, appear in the stool at the onset of symptoms and are infectious immediately upon excretion. Oocysts continue to be excreted in the stool for several weeks after symptoms resolve; outside the body, they may remain infective for 2-6 months in a moist environment.

### *8. Susceptibility and resistance*

People with intact immune function may have asymptomatic or self-limited symptomatic infections; it is not clear whether reinfection and latent infection with reactivation can occur. Individuals with impaired immunity generally clear their infections when the causes of immunosuppression (including malnutrition or intercurrent viral infections such as measles) are removed. In those with AIDS, even though the clinical course may vary and asymptomatic periods may occur, the infection usually persists throughout the illness; approximately 2% of AIDS patients reported to CDC were infected with cryptosporidiosis when AIDS was diagnosed; hospital experience indicates that 10%-20% of AIDS patients develop infection at some time during their illness.

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## B. METHODS OF CONTROL

### *1. Preventive measures:*

a. Educate the public in personal hygiene.
b. Dispose of feces in a sanitary manner; use care in handling animal or human excreta.
c. Have those in contact with calves and other animals with diarrhea (scours) wash their hands carefully.
d. Boil drinking water supplies for 1 minute; chemical disinfectants are not effective against oocysts. Only filters capable of removing particles 0.1-1.0 µm in diameter should be considered.
e. Remove infected persons from jobs that require handling food that will not be subsequently cooked.
f. Exclude infected children from day care facilities until diarrhea stops.

### *2. Control of patient, contacts and the immediate environment:*

a. Report to local health authority.
b. Isolation: For hospitalized patients, enteric precautions in the handling of feces, vomitus and contaminated clothing and bed linen; exclusion of symptomatic individuals from food handling and from direct care of hospitalized and institutionalized patients; release to return to work in sensitive occupations when asymptomatic. Stress proper handwashing.
c. Concurrent disinfection: Of feces and articles soiled therewith. In communities with modern and adequate sewage disposal systems, feces can be discharged directly into sewers without preliminary disinfection. Terminal cleaning. Heating to 45°C (113°F) for 5-20 minutes, 60°C (140°F) for 2 minutes, or chemical disinfection with 10% formalin or 5% ammonia solution is effective.
d. Quarantine: None.
e. Immunization of contacts: None.
f. Investigation of contacts and source of infection: Microscopic examination of feces of household members and other suspected contacts, especially those who are

symptomatic. Contact with cattle or domestic animals warrants investigation. If waterborne transmission is suspected, large volume water sampling filters can be employed to look for oocysts in the water.

g. Specific treatment: No treatment other than rehydration, when indicated, has been proven to be effective; administration of passive antibodies and antibiotics is under study. If the individual is taking immunosuppressive drugs, these should be stopped or reduced if possible.

### *3. Epidemic measures*

Investigate clustered cases in an area or institution epidemiologically to determine source of infection and mode of transmission; search for a common vehicle, such as recreational water, drinking water, raw milk or other potentially contaminated food or drink, and institute applicable prevention or control measures. Control of person to person or animal to person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces.

### *4. International measures*

None.